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APPENDIX:
LD32 with ED-516
Installation and Operation Manual
ModBus TCP output

Contents

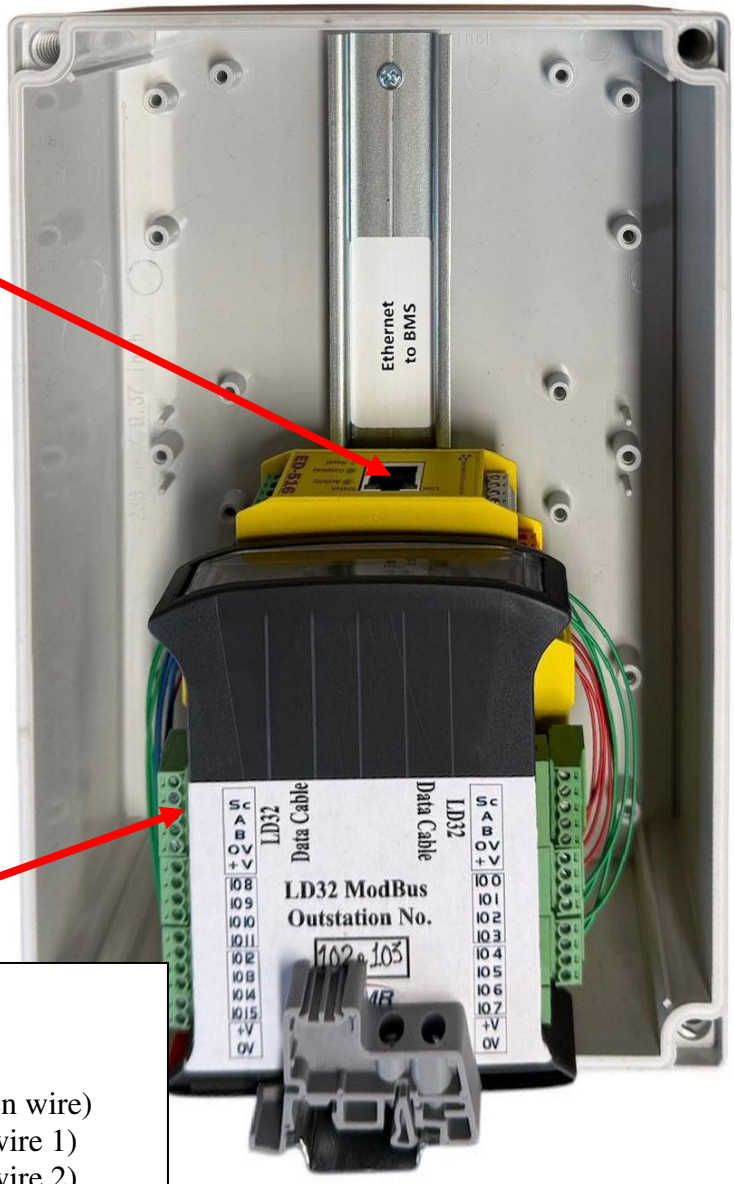
This is a manual to show how the LD32Water Leak Alarm Panel can be connected to your BMS/PLC Alarm via ModBus TCP output.

For more detailed information on the installation and testing of the LD32 Alarm Panel, please see the main Installation and User Manual.

1) Connecting your Modbus Interface Unit to your BMS/PLC

1. Position the Modbus Interface Unit in a convenient position so that you can connect both the RS485 and the BMS RJ45 ethernet cable.
2. Once positioned, connect the LD32, RS485 cable to the indicated terminal block in the same way as the outstations (see Main LD32 Manual Section 15),
3. Plug in the RJ45 connector (standard straight-through or crossover Ethernet cable) to any RJ45 socket.

RJ45 ModBus connection to BMS



RS485 terminal block layout
Sc|A|B|0V|+V

Control unit		***Outstation***	
Sc	to	Sc	(Screen wire)
A	to	A	(wire 1)
B	to	B	(wire 2)
0V	to	0V	(wire 3)
+V	to	+V	(wire 4)

Wrongly or badly connected wiring will result in damage or intermittent alarms or faults

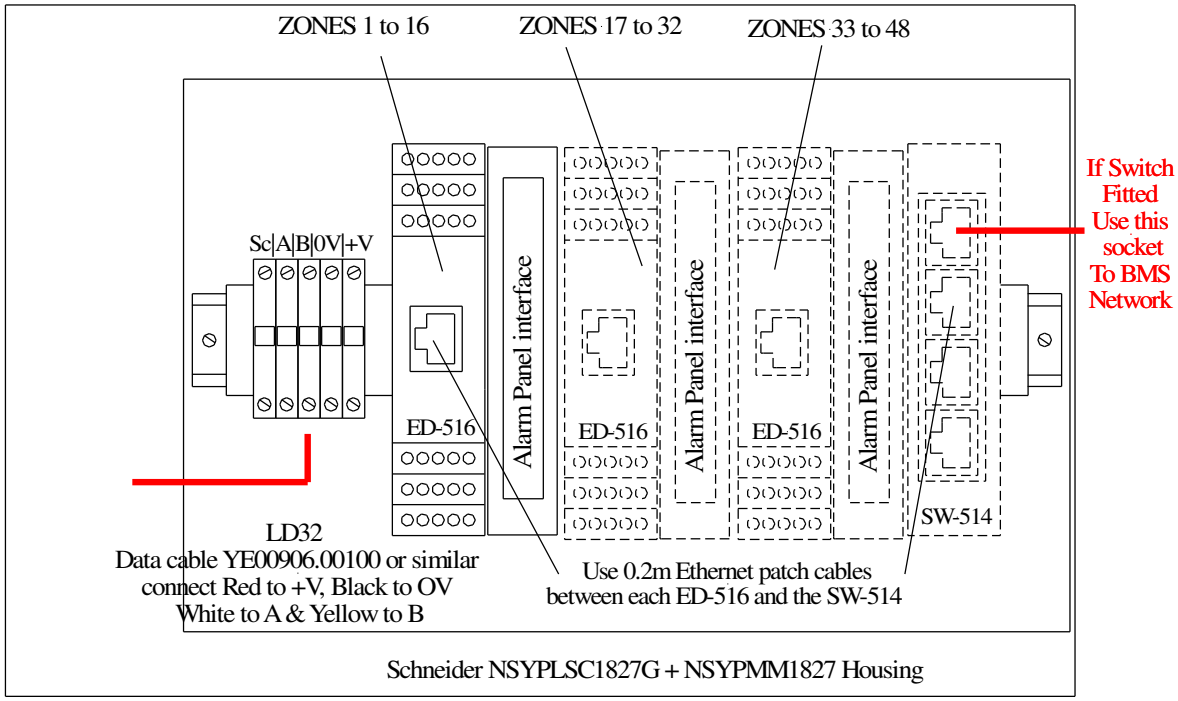
2) Pin Outs on the Modbus Interface Unit

Modbus interface is via one or more Brainbox ED-516 Modbus modules, each giving a zone alarm Status high (1) for alarm and zero (0) for zone clear.

Modbus is provided by using 16 channel digital input to Modbus modules type ED-516.

If the number of zones exceeds 16, a number of Modbus modules will be provided depending on the total number of zones (Zones 1-16 = one module; up to 32 zones will be two modules etc.)

As each ED-516 module only has one RJ45 port, if multiple modules are required, a 4-way ethernet switch will be provided.



Digital I/O Port	Input
IO 0	Zone 1 (area to be monitored for leaks)
IO 1	Zone 2 (area to be monitored for leaks)
IO 2	Zone 3 (area to be monitored for leaks)
IO 3	Zone 4 (area to be monitored for leaks)
IO 4	Zone 5 (area to be monitored for leaks)
IO 5	Zone 6 (area to be monitored for leaks)
IO 6	Zone 7 (area to be monitored for leaks)
IO 7	Zone 8 (area to be monitored for leaks)
IO 8	Zone 9 (area to be monitored for leaks)
IO 9	Zone 10 (area to be monitored for leaks)
IO 10	Zone 11 (area to be monitored for leaks)
IO 11	Zone 12 (area to be monitored for leaks)
IO 12	Zone 13 (area to be monitored for leaks)
IO 13	Zone 14 (area to be monitored for leaks)
IO 14	Zone 15 (area to be monitored for leaks)
IO 15	Zone 16 (area to be monitored for leaks)

3) Assigning an IP Address

On connecting to the network, the device automatically checks if it is connected to a DHCP Server. If this is the case, the DHCP server will allocate an IP address automatically to the ED device.

If no DHCP server is detected (e.g. you are using a direct cable connection to the PC) the ED-008 device will default to an IP address of:

192.168.127.254

Please ensure the PC you're using for configuration can communicate with the 192.168.127.XXX IP range, as sometimes the subnet mask on the PC needs to be altered.

In Windows, browse the network (Start > Network) and look under "other devices". Double-click the device to open its home webpage in a browser.

4) Installing Boost.IO Manager

To control your ED device using a Window's PC's COM port you need to install Boost.IO manager.

1) Click on the following link to install Boost.IO software: https://www.brainboxes.com/faq/boostio-software-installation
2) When installation is complete, you should see an icon labelled Boost.IO Manager on the desktop. Double click this icon to open the application.

5) Configuring your ED-516 Device

1) In Boost.IO Manager, double-click the installed COM Port under the "COM Ports section in the left panel.
2) Click on the "Port Settings" tab, then on the "Configure Settings" button.
3) This will open the web configuration page from which all the settings of the ED-516 device can be changed.

6) Firewall Exceptions and Port Numbers

When using the ED-516 device with a firewall you may need to manually add the exception entries and port numbers to the firewall list.
Below are the default ports numbers and the firewall exceptions.

Function	Default port number
Device web server	TCP port 80
ASCLL protocol	TCP port 9500
Modbus protocol	TCP port 502
Serial port	TCP port 9001
Firmware upgrade	UDP ports 67, 68, 69

Default Windows Firewall Exception entries:

- Brainboxes Boost.IO Suite
- Brainboxes Boost.IO Suite (Device Discovery) [Except Windows XP 32 & 64 bits]
- UPnP Framework (Windows X 32 & 64 bits)
- Network Discovery (Windows 7 or later)

7) LED Information on ED-516 Device

Status LED	Green	Device Ready
	Flashing Yellow	Changing Settings
	Flashing between Red & Green	Querying IP
	Flashing Green & Red	User performing hard reset
	Flashing between Green, Red/Yellow	IP address diagnostic
	Flashing between Green & Yellow	Initialization diagnostic
Activity LED	Flashing Green	Output Set/Input Read
	Flashing Red	Output overload
Link LED	Green	Network Link Established
	Flashing Green	Network Data RX/TX
Gateway LED	Flashing Green	RS-485 data TX/RX
	Flashing Red	RS-485 Comms error

8) Input/Output Specification

Inputs	
NPN	One jumper configures all inputs with a pull-up for NPN (contact closes to 0V)
Logic Level 0	0V to +1V maximum
Logic Level 1	+2.0V to +30V maximum
Latched Inputs	Triggered by Alarm Panel, stays true until acknowledged
Counter Inputs	Counts positive or negative transitions up to 250Hz count rate. 16-bit (66335 count) or 32-bit (4.2 million count) counters. Counter values persist over power-off periods

Outputs	
Maximum output current	0.85A on all outputs simultaneously (ambient temperature ≤ 70°C, 1m/s airflow) 0.5A on all outputs simultaneously (ambient temperature 70-80°C, 1m/s airflow) Outputs can be paralleled for higher current loads
Maximum voltage	36V
ESD Protection	Intelligent short circuit protection up to 36V. Over-temperature shutdown ESD Protection to 16kV

9) Operation

The system monitors and manages outstations for water leaks and sensor disconnections, reporting back to the main controller. On startup, it checks all outstations, displaying "SETTING UP PLEASE WAIT" until complete. If no issues are found, the system shows all zones as "NORMAL," and the backlight turns green. After five minutes, the display enters power-saving mode but can be reactivated for five minutes with the "Light" button.

Alarms: When a water leak is detected:

- The outstation's "Alarm" lamp flashes, and the main controller displays the alarm with flashing red and white backlight.
- Relays, sounders, and optional messaging systems activate.
- The "Mute" button reduces notifications, but the alarm remains displayed until resolved. The system resets once water is removed and the alarm muted.

Faults: Sensor disconnections trigger similar notifications, with the outstation's "Fault" lamp flashing. The system resets once the fault is fixed and muted.

Outstation Indicators:

- An "Active" lamp shows communication status with the main unit.
- An "Info" button on the controller provides zone, outstation, alarm, and fault details.

Valve Control: Optional water shutoff valves can be configured for individual or shared zones. Indicators show valve status. A "Valve Override" button can reopen a valve during an alarm after an audible prompt. The system ensures efficient local and central alarm management, providing clear indications and reset mechanisms for maintenance staff.

For more detailed information on how the LD32 Alarm panel is installed, please see the main Installation Manual.

10) Support and Help

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